

## ***Interactive comment on “Mobilisation or dilution? Nitrate response of karst springs to high rainfall events” by M. Huebsch et al.***

### **Anonymous Referee #1**

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Within scope of journal? The focus of this study was to develop conceptual models for changes in nitrate concentrations in spring discharge over time. These models were developed to answer two questions regarding factors responsible for nitrate concentrations in karst springs responding to rainfall events, and the effects of the hydrogeology, land use, or both. Using their field study and several other published field studies, the authors develop four scenarios or models to explain precipitation-initiated changes in nitrate in time for spring water. Consequently, this work falls well within the scope of the journal.

Meets basic scientific quality? Overall, the author's research techniques and data analyses were well done and yielded interesting results, particularly the continuous nitrate data for almost two years. The evaluation of those data was added to several other

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published studies in order to get a more complete picture of the various environmental conditions and resultant changes in nitrate concentrations in springs.

Contributes something new to the field of hydrology? The study addresses systems that can be rather complex on a local/detailed level, but potentially simpler on a regional scale. Their models are a summary of results from this study and other studies. The models presented may be useful guides for regulators in determining the best actions to take in order to reduce nitrate concentrations. The continual monitoring of nitrate concentrations is interesting and an improvement over weekly and monthly sampling. The models presented would be unnecessary for those familiar with nitrate contamination of karst springs. However, the models do provide a tool for regulators to quickly interpret nitrate patterns in spring water data. Such information would help guide them to making informed decisions in attempting to reduce nitrate levels in waterways.

Technical Comments: The authors describe a dual system of porosity when most researchers in karst describe a triple porosity system (matrix, fractures, conduits). This difference needs to be addressed.

Dye tracing is mentioned on page 4137, line 25, but no information about how it was done and no results are presented. Either explain the methods and results or delete.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 4131, 2014.